



School of Economics and Management

TECHNICAL UNIVERSITY OF LISBON

Department of Economics

Ana S. Branca

***The Impact of Cognitive versus Affective Aspects on Consumer
Usage of Financial Service Delivery Channels***

WP 011/2007/DE

WORKING PAPERS

ISSN N° 0874-4548



The Impact of Cognitive versus Affective Aspects on Consumer Usage of Financial Service Delivery Channels

Ana S. Branca

Instituto Superior Técnico / CEG-IST,
Technical University of Lisbon
Av. Rovisco Pais, 1049-001 Lisboa, PORTUGAL
e-mail: anabranca@ist.utl.pt

ABSTRACT

This paper explores the consumer decision-making process when using service delivery channels. Among service delivery channels, the main focus of the research concerns technology-based delivery channels. Technology continues to change the delivery function of companies and to affect customers' usage decisions regarding the delivery channels available. Understanding how customers react to the technology-content of channels and decide how to use the delivery channels of the firm is a key asset for achieving profitability and differentiation. This conclusion is particularly valuable as firms address the financial impact of new technology-based channels and their success in transferring low value-added transactions to electronic channels. Despite the development of new technology-based delivery channels, there is limited knowledge about how customers react to, choose and use these channels.

The paper addresses this research void by developing a model that describes customers' attitudes and usage frequency behavior in the context of banking delivery channels. A set of hypotheses concerning affective and cognitive determinants of consumers' behavior is derived from the model. These hypotheses were generated after extensive research into the fields of services marketing, psychology and innovation theories, together with insights provided by a series of in-depth interviews conducted with bank managers and customers. A questionnaire was mailed to users of the four main bank delivery channels. The findings demonstrate that consumer decision concerning usage frequency differs between delivery channels, and illustrate which factors should be stressed in order to affect this decision.

INTRODUCTION

Technology is increasingly transforming the marketplace into a marketspace (Rayport and Sviokla, 1995), by expanding the delivery channels consumers have available. This technology infusion in services has changed the nature of service encounters, which are now conceptualized as "the dynamic relationship between employees, customers, and technology" (Bitner et al., 2000). The various levels of technology infusion will determine different types of interaction between a firm and its customers. Conceptually, the delivery channels of a firm can be categorized according to the type of interaction generated: face-to-face interactions, such as those occurring in a bank's branches, can be characterized as high touch/low tech, whereas remote interactions mediated by technology (face-to-technology), such as those occurring through the ATM network or the Internet, are characterized as high tech/low touch.

Bank interactions through the telephone-based access lie somewhere in the middle, with moderate personal interaction (when the contact occurs through an human operator) mediated by a technological device.

Alternatively, Dabholkar (1994) developed a classification scheme for services using two dimensions: “who delivers and where is the service delivered?”. According to this scheme, one could think of branch interactions as person-to-person contacts at the service site, of ATM interactions as person-to-technology contacts at the service site (which nowadays corresponds to a multitude of locations), of phone interactions as person-to-person or person-to-technology contacts (depending on the answering system) at customer’s home/work, and of Internet interactions as person-to-technology contacts at customer’s home/work. As such, the technology-based delivery channels for the banking industry that are discussed in the paper correspond to remote interactions mediated by technology, that is, interactions between a bank and its customers occurring through the ATM network, the telephone-based and the Internet-based access. The branch interactions are also covered. Although there are four channels presented, the research and its results are to be analyzed on a channel basis.

As the main purpose of the research is to understand the determinants of consumers’ usage decisions concerning the frequency with which technology-based delivery channels are used, two streams of research are combined: consumers’ adoption of innovations and individual consumption behavior.

Traditionally, consumers’ adoption of innovations is explained with cognitive, rational reasoning (*thinking*). Cognitive determinants of adoption behavior are based on beliefs about the attributes of a product/object or about the consequences of a behavior. In this study, a model is proposed and tested that considers not only cognitive, but also affective (*feeling*), emotional factors to explain consumers’ adoption of innovations. Affective determinants of adoption behavior are based on the positive/negative feelings that interaction with an object, or that a behavior, provoke. Additionally, individual consumption has been found to be determined not only by utilitarian reasons, but also by an experiential perspective (McGregor, 1974; Holbrook and Hirschman, 1982), in which pursuit of fun and enjoyment directs customers’ behavior. So, a further objective is to find out if the experiential perspective can be extended to the use of technology-based delivery channels.

The target behavior of the study is the usage frequency with which a delivery channel is adopted for interaction with the firm. It is assumed that the usage frequency decision will reflect the willingness to use a particular channel. Customers were questioned about the main

service operations available in the main delivery channels of the firm. It is not intended to study the determinants of channel choice, but rather the determinants that explain why, within a particular delivery channel, users of that channel adopt more or less frequently the channel. It is considered that the need to perform a banking transaction can be satisfied through more than one channel: using a specific delivery channel to satisfy that need will also depend on how the customer relates to that channel (cognitively and affectively).

This research is valuable for managers in a time when the strategic and financial importance of increasing usage of remote channels is stressed, together with decreasing usage of channels based on face-to-face interactions (especially for low value-added operations). Researchers examining the trade-off between 'high tech' versus 'high touch' channels, argued that the former are effective for cost reduction and the latter for relationship building (Heute and Roth, 1988; Apte and Vepsalainen, 1993; Heim and Sinha, 2000; Walker et al., 2002). Consequently, there is interest in finding out the relevant predictors of usage frequency for a specific delivery channel. Service delivery channels poorly designed that are not able to stimulate a desired increase in usage will reflect high costs without reaching the target audiences. Therefore, this information will increase companies' effectiveness and efficiency in addressing different customer profiles, while enhancing usage of technology-based service deliveries.

Research has been sparse concerning self-service technologies, as the emphasis has been to study customer behavior in terms of interpersonal interactions. In the literature, constant calls have been made for further research on technology-based delivery channels (Steenkamp et al., 1999; Bitner et al., 2000; Eroglu et al., 2000; Meuter et al., 2000; Henderson and Kunz, 2001). As a result, this study attempts to contribute to a better understanding of the consumer/company interaction in the presence of remote channels. The banking industry was chosen to test the proposed relationships, as it is a service industry with several delivery channels available for the same set of operations and in which there are constant efforts to transfer low value-added transactions from the branches to the remote delivery channels.

LITERATURE REVIEW

The literature streams of marketing and social psychology provide the theoretical background to the research, in particular the literature pertaining to technology and consumer behavior.

Technology

Channel technologies, through their impact on firms' delivery systems, represent a major stake for service providers (Roth and Velde, 1989; Dabholkar, 1996). The context in which decisions are taken is changing, as technology developments increasingly allow for remote service encounters. Additionally, these new delivery options parallel market social trends. The replacement of human service by a technology usually requires both the development of new knowledge and behavior associated with the service, and also increased customer participation and responsibility in the production of the service. Concerning financial services, information technology is fundamentally changing the financial services industry worldwide, altering traditional definitions of product, market and customer base (Pyun et al., 2002). How customers react to this 'technology infusion' (Bitner et al., 2000) is something that needs to be understood so that firms may benefit from the technological element in their service provision.

Banks and other financial institutions had assumed that customers would accept and prefer less personal attention and learn the new systems. Customers' attitudes toward technology and financial services delivery are changing (Harden, 2002). Some customer segments are becoming more technically and financially savvy, which motivates them to self-manage their financial investments (Devlin, 1995; Kimball et al., 1997; Mulligan and Gordon, 2002) and to use self-service delivery channels. However, evidence suggests that fewer customers than anticipated have accepted the banks' perspective and embraced the new technologies (Sarel and Marmorstein, 2002).

The potential success of self-service technologies depends of customers' acceptance. This has led researchers to consider self-service technologies as a 'double-edged sword' (Lee and Allaway, 2002; Walker et al., 2002), and as involving 'technology paradoxes' (Mick and Fournier, 1998). Successful self-service technologies improve service firms' resource management by lowering delivery costs and releasing service personnel to provide more varied and better service (Berry, 1985), but unsuccessful ones add nothing but extra fixed and operational costs (Lee and Allaway, 2002).

Consumer Behavior

There is debate in the consumer behavior literature over which component(s), cognitive and/or affective, induces behavior and, for a long time, the prevailing opinion was that cognitive processes were the trigger to attitude formation and behavior (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Poczter, 1987; Ajzen, 1991). These contributions are based

on the assumption that all behavior involves a choice and that individuals are quite rational, making systematic use of the information available.

This cognitive emphasis has been questioned by other researchers who consider that cognitive evaluations are important, but are not the sole influence on behavior, and that under different circumstances, individuals might develop other attitude formation processes (Bettman, 1982; Holbrook and Hirschman, 1982; Zajonc and Markus, 1982; Gatignon and Robertson, 1985). For these researchers, cognitive and affective factors may interplay in a variety of combinations and dominances.

As this research covers behaviors that are considered innovative (usage of technology-based service deliveries), and that might be explained with either a general or with a more specific model, consumer adoption models were also reviewed. Models such as the Technology Acceptance Model (Davis et al., 1989), the Innovation Diffusion Theory (Rogers, 1995), and Gatignon and Robertson's Diffusion and Adoption Model (1985) have been developed to explain consumers' adoption of innovations. These models are based on a cognitive appraisal, favoring the attributes pertaining to the characteristics of an innovation as the determining factors of its adoption. Dabholkar (1996) studying service quality found that consumers deal with unfamiliar or new situations, such as technology self-service options, in a rational and cognitive way. Parasuraman (2000) proposed the 'Technology Readiness Scale' to represent people's propensity to embrace and use new technologies for accomplishing goals. Although this construct is intended to reflect an overall state of mind, it favors in its components a cognitive evaluation. Similarly, the empirical studies reported on the adoption of innovations tend to concentrate on cognitive determinants.

MODEL DEVELOPMENT

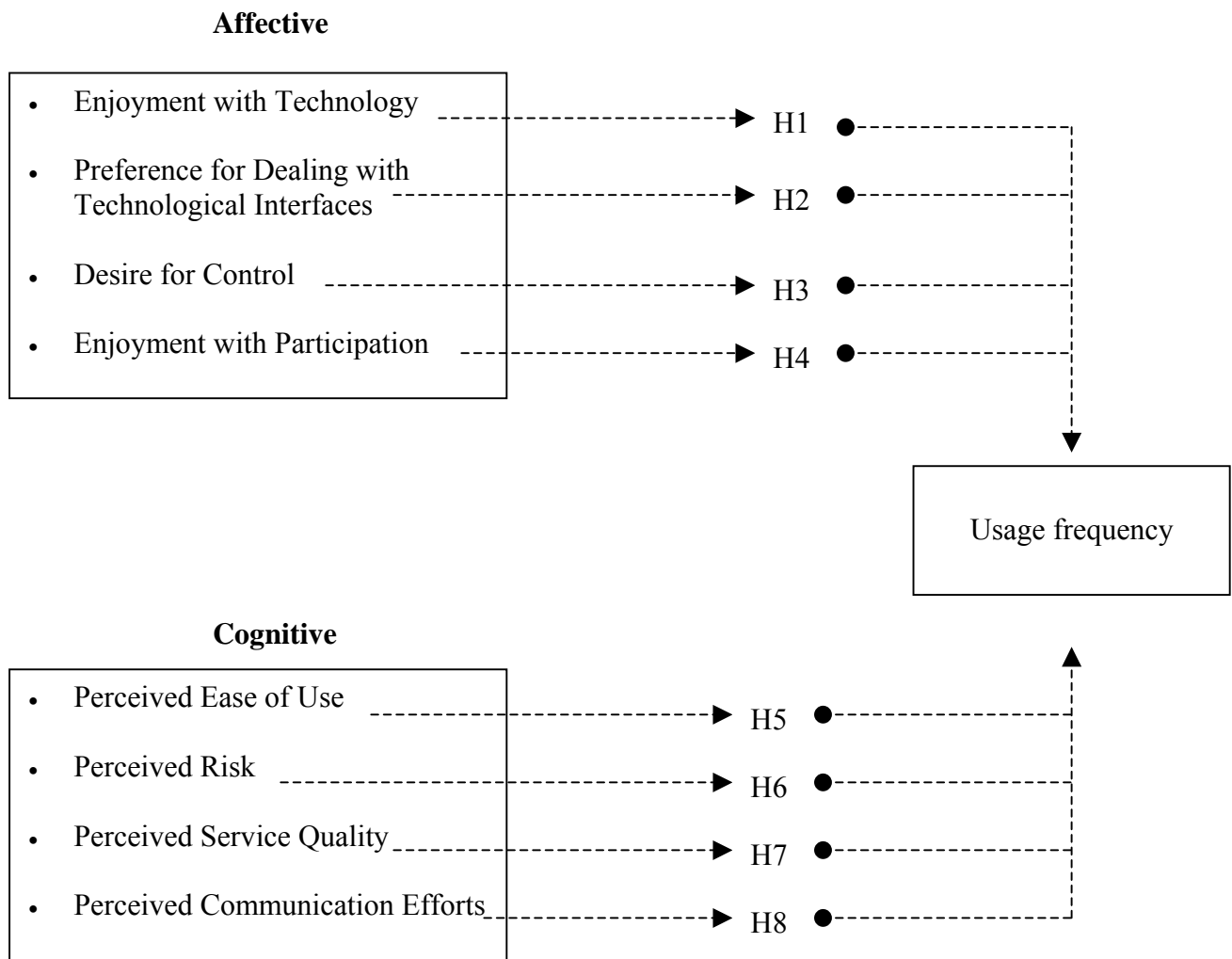
Based on the literature reviewed, a model is proposed to explain consumer decisions on usage of technology-based channels. It is assumed that consumer behavior is driven by cognitive and affective factors. While conclusions from the theories reviewed favor a cognitive-based evaluation of new technologies, research has also produced examples of the importance of affect as a behavior determinant (Mehrabian and Russel, 1974; Black et al., 2002). The combined analysis of these two streams (cognitive and affective-based evaluations) has not yet been researched for technology-based service deliveries and for their preference over human-based deliveries.

Consumer behavior is both fascinating and complex, and these two perspectives complement each other and enrich consumer research. Trying to describe consumer behavior

by attending to only one of them is to neglect important aspects of the consumer psyche (Olshavsky and Granbois, 1979; Holbrook et al., 1984). Playful consumption has been studied in relation to hobbies (Bloch and Bruce, 1984), creativity (Hirschman, 1983), leisure activities (Unger and Kernan, 1983), games (Holbrook et al., 1984), and aesthetic appreciation (Osborne, 1979). It is intended to extend this perspective to technology. Interaction with technology-based devices or interfaces can be both a rational and an affective decision. One can have a preference for the net utility benefits and/or for the playful aspect embodied in technology as the input(s) for this interaction. Holbrook and Hirschman (1982) proposed the experiential perspective, in which the consumer is directed by an hedonic pursuit of pleasure, seeking fun, amusement, fantasy, and enjoyment (or alternatively, consumers can derive value from avoidance of negative feelings). The logic behind this perspective of consumer behavior is that consumers appreciate an object for its own sake, apart from any utilitarian function it may or may not perform.

As such, a model (Figure 1) explaining consumers' decisions on usage frequency of technology-based delivery channels is proposed, with both cognitive and affective determinants. The specific factors tested as predictors derive from the literature reviewed and from a series of in-depth interviews with bank customers and managers. The factors tested as cognitive influences on usage decision are perceived ease of use, perceived risk, perceived service quality and perceived communication efforts. These cognitive determinants describe perceptions about the attributes of the delivery channels, or about the firm, and are rationally evaluated by customers, weighting the pros and the cons. Similarly, the factors tested as affective determinants are enjoyment with technology, preference for dealing with technological interfaces, desire for control and enjoyment with participation. This set of affective determinants corresponds to feelings, that is, emotional sensations that result from the interaction with delivery channels. It is recognized that the list of tested determinants could be extended. Nevertheless, this set was considered the most appropriate considering the literature, the results from the in-depth interviews and the exploratory nature of the research.

Figure 1: Model of consumers' usage frequency decision of service delivery channels



Affective Determinants

Enjoyment with technology

A number of researchers have approached the issue of how consumers deal emotionally with technology, namely self-service interfaces. Langeard, Bateson, Lovelock, and Eiglier (1981) found that some people enjoy playing with machines and suggested that these people may prefer self-service options. Dabholkar (1996) found a positive relationship between expected enjoyment from using a technology-based self-service option and expected service quality. Meuter, Ostrom, Bitner, and Roundtree (2003) suggested that customers have to feel comfortable with technology in order to use a self-service technology option and that the

technology anxiety construct, focusing on a user's state of mind about general technology tools, influenced self-service technologies' usage.

It is hypothesized that consumers react affectively to technology and to technology-based delivery interfaces. Independently of the innovation's perceived benefits, risks and complexities, consumers through their personal experiences and characteristics develop a multitude of affective reactions such as fun, enjoyment or fear toward technology in general.

H1: A consumer's enjoyment with technology will influence the likelihood of that consumer using more frequently technology-based service deliveries.

Preference for dealing with technological interfaces

The preference for technological interfaces contrasts with a preference for human interfaces (i.e., dealing with people instead of machines). Dabholkar (1996) confirmed that the need for interaction with employees was a negative influence on the intention to use self-service options, mediated by the expected service quality of those self-service devices. People differ in how they feel about using machines *vs.* interacting with people. Zeithaml and Gilly (1987) found that some people feel strongly that the use of machines (i.e., technology interfaces) de-humanizes service encounters. Other people negatively value some aspects of human interaction (e.g., less speed, chance of human error) together with not valuing the social aspect of human interaction. For these customers, technological interfaces are preferred to human interactions.

H2: A consumer's preference for dealing with technological interfaces will influence the likelihood of that consumer using more frequently technology-based service deliveries.

Desire for control

Marketing researchers have viewed the term 'control' to indicate a person's exercise of direction over some object, while researchers of perceived control have defined 'control' as a sensation, rather than just an activity (Tangsrud and Smith, 2001). Perceived control has been considered to be a global indicator, summarizing the perceptual aspect of an individual's service experience, a crucial antecedent of consumer behavior, and a concept useful for understanding the service encounter (Bateson, 1985b; Bateson and Hui, 1990). Perceptions of control will evoke positive or negative affect, as they are related to a consumer's judgment of whether the environment will facilitate or frustrate goal achievement.

Burger and Cooper (1979) introduced the notion of ‘desire for control’ as a stable personality trait reflecting the extent to which individuals, generally, are motivated to control the events in their lives. More control in events means more responsibility for the outcomes of consumers’ choices. When that happens, people are more likely to attribute success to self, especially in services where the consumer co-participates in the production of the service.

Consumers’ enjoyment with control, and consequent desire for control, will contribute to their attraction to some delivery channels and avoidance of others. Usually, self-service delivery channels evoke higher perceived control of the service production and delivery, because customers have their co-producing role enhanced and a higher content of the service depends on their inputs and efforts. The more a customer enjoys being in control, the more he/she will be attracted to a more frequent usage of technology-based (i.e., self-service delivery) channels.

H3: A consumer’s desire for control will influence the likelihood of that consumer using more frequently technology-based service deliveries.

Enjoyment with participation

Service participation refers to the degree to which a customer is involved in producing and delivering the service (Dabholkar, 1990) or, in other words, participation is the consumer’s ability to exercise options, which affect the sequence and substance of service delivery throughout the service experience (Goodwin and Radford, 1993). The ‘enjoyment with participation’ variable refers to the affective compensation that the customer obtains from being involved and participating in the events in his/her life. Consumers differ in their willingness to participate in the service encounter.

Bateson’s findings (1985a) revealed that propensity to participate might transcend particular services, and that for certain individuals ‘doing it themselves’ would be attractive even when monetary or time-saving incentives were not present. Research results show that some people find participation intrinsically attractive, while others find more participative behaviors inherently unattractive (Langeard et al., 1981; Dabholkar, 1996; Bitner et al., 1997).

H4: A consumer’s enjoyment with participation will influence the likelihood of that consumer using more frequently technology-based service deliveries.

Cognitive Determinants

Perceived ease of use

If an innovation is perceived as complex to use, that will undermine its likelihood to be adopted. Similarly, if an innovation is perceived as easy to use, that will enhance its adoption (Davis, 1989; Rogers, 1995). Te'eni (1989) also concluded that perceived complexity affects the decision maker's actions and performance.

The less easy to use a technology is perceived to be, the higher the cognitive effort required. This difficulty, if perceived excessive, may undermine the individual's interest in using such a technology and limit his/her usage of a technology-based remote channel.

H5: A consumer's perceived ease of use of a delivery channel will influence the likelihood of that consumer using more frequently the delivery channel.

Perceived risk

Perceived risk is particularly relevant in consumer decision-making, as it represents the uncertainty about the potential outcomes of behavior and about the unpleasantness of those outcomes (Cunningham, 1967; Taylor, 1974; Murray, 1991; Dowling and Staelin, 1994). Perceived risk has to do with what one acquires, but also with how and where one acquires it (Hisrich et al., 1972). Consumers perceive risk in store purchases, thus it is expected that they perceive higher risk in remote purchases. Additionally, in services, the uncertainty of the outcomes and, consequently, the perceived risk is higher than in a goods context (Mitchell, 1994). As a result, delivery channels have their own specific risks and the risk perception of a new channel influences the choice for transacting via that channel (Bhatnagar et al., 2000). Recent research on perceived risk focusing on Internet shopping suggests that the reluctance that many consumers have to shop online is due to the higher perceived risks (Forsythe and Shi, 2003).

H6: A consumer's risk perception of a delivery channel will influence the likelihood of that consumer using more frequently the delivery channel.

Perceived service quality

Service quality is considered to be a cognitive evaluative element that influences the usage decision for both interpersonal and technology-based encounters (Gronroos, 1988; Berry and Parasuraman, 1991). In this research, the scale used to measure service quality derives from SERVPERF (Cronin and Taylor, 1992) since it contains only perception items, but it

represents the five dimensions of SERVQUAL (Parasuraman et al., 1988), adapted to the banking context with a focus on technology-based service deliveries. The dimensions of service quality modeled are the ones considered in Parasuraman, Zeithaml, and Berry's research (1988), that is, reliability, responsiveness, assurance, empathy and tangibles. These dimensions, although conceived for interpersonal encounters, can, with context adaptations, be used to describe the quality of technology-based (remote) encounters.

H7: A consumer's perception of service quality will influence the likelihood of that consumer using more frequently the delivery channels of the firm.

Perceived communication efforts

Marketing communications is a crucial aspect of a company's overall marketing strategy, and particularly of service firms where the product is intangible. Effective communication is essential to form strong customer brands, highlighting the importance of this element in the company's strategy. It concerns aspects that illustrate service quality, in terms of being close to customers and providing them with up-to-date and valuable information, but constituting a different dimension than that of overall service quality. Smith (1989), analyzing the relationships between banks and their small business clients, found that one major element of what was considered to be poor service was insufficient information. The importance of this variable as a separate construct was highlighted in the interviews conducted with bank customers.

H8: A consumer's perception of communication efforts of the firm will influence the likelihood of that consumer using more frequently a delivery channel of the firm.

This set of hypotheses will be analyzed on a channel basis, that is, by delivery channel.

Usage of the Delivery Channel

Consumer behavior is considered in terms of usage frequency: how frequently the user accesses his/her bank accounts and contacts the bank through a specific delivery channel. This usage definition conceptualizes the likelihood of using a particular delivery channel. This dimension of usage has been used in the literature (Gatignon and Robertson, 1985; Zaichkowsky, 1985; Ram and Jung, 1991) in studies of usage and adoption of innovations/products.

RESEARCH DESIGN AND DATA COLLECTION

The data collection process began with a series of in-depth exploratory interviews conducted with bank managers and bank customers, followed by a survey in which a questionnaire was distributed to a stratified random sample of bank customers. A total of seventeen in-depth interviews took place, nine interviews with bank managers and eight interviews with bank customers. These in-depth interviews allowed an initial grasp of the important issues for both sides in the provision of a satisfying banking service, provided clarification of the research problem and assisted the formulation of a questionnaire for the quantitative research stage.

The sample comprised four strata including users of the main bank delivery channels: the Internet-based delivery channel, the telephone-based access to the bank, the debit-card access (through the ATM network) and a stratum of users of the branch network of the bank. The strata construction followed the definition of a user of a delivery channel as a client who had used that particular delivery channel in two specified months of that year (namely, January and February, considered to be typical months for the banking business).

One major bank¹ agreed to collaborate in the research by distributing the questionnaire to its customers. In order to have the strata as mutually exclusive groups of users, it was decided to have a 'pyramidal definition' of the strata. Following the bank rules on access to the delivery channels, the strata were successively extracted from the global customer base: the first stratum to be identified was users of the Internet-based access, followed by users of the telephone-based channel, debit card users and branch users. This sequential process avoided duplication of customers among strata. The branch users received a shorter questionnaire, as questions about the technology-based channels did not make sense for these customers.

The questionnaire was mailed to 6,000 customers of each stratum, leading to a total of 24,000 questionnaires sent to users of the various delivery channels. Although the response rate differed among the strata, the overall response rate was 20.2%. A total of 4,852 questionnaires were received, of which 3,250 were considered usable (1,467 from the on-line channel users, 682 from the telephone-based access users, 731 debit card users and 370 branch users). The difference between the response rates was considered to result from differences in education and in understanding the benefits of the bank's effort: the questionnaire was presented as coming from the bank with the intent of increasing customer satisfaction. The survey responses were not re-weighted to correct for differences in the

¹ The identity of the organization that provided the data is kept confidential to honor the wishes of the sponsor.

response rates, as the purpose was not to analyze the aggregate results, but rather to study the data on a stratum basis (Groves et al., 1992).

The data from the questionnaire were first factor analyzed in order to produce the variables that were subsequently related with usage behavior through ordered logistic regressions. Factor analysis was used to reduce the items of the questionnaire to a smaller set representing the cognitive and affective variables. Ordered logistic regression was considered to be the appropriate instrument to analyze the influence of affective and cognitive determinants of usage, due to the ordered and discrete nature of the outcome variable. The objective was to have the most parsimonious model that best describes the data (Hosmer and Lemeshow, 1989). When the model contained the variables that were significant in the correct functional form, the model's goodness-of-fit was assessed with measures such as the likelihood ratio test, the Wald test, the deviance, the Akaike Information Criterion, and the Bayesian Information Criterion.

Usage frequency was operationalized as customers' frequency of use (ranging from "Never", "Less than once a month", "One/two times a month", "One/two times a week" and "Most days") of the different delivery channels (branch network, debit card network, telephone-based and Internet-based access). The definition of this dimension of usage follows Ram and Jung (1991) and Zaichkowsky (1985) who defined usage frequency as how often the product was used or the different applications for which the product was used.

DATA ANALYSIS

Factor Analysis

A factor analysis with orthogonal rotation was performed, as the objective in this exploratory research was to produce uncorrelated constructs. This is considered adequate when the objective is to reduce the number of original variables to a smaller set of uncorrelated variables for subsequent use in prediction techniques, which was the case. Among the orthogonal rotation methods, Varimax was used. The factor analysis conducted with the four strata of respondents produced some differences across strata, as can be observed in Table 1:

Table 1: Comparison of the factor analysis between the four channel strata

Factor title	Debit-card channel	Telephone-based channel	Internet-based channel	Branch channel	Factor belonging to group ^a
Perceived Service Quality (5 dimens.) ^b	X ($\alpha=0.926$)			X ($\alpha=0.939$)	C
Perceived Service Quality (4 dimens.)		X ($\alpha=0.907$)	X ($\alpha=0.899$)		C
Enjoyment with Technology	X ($\alpha=0.741$)	X ($\alpha=0.749$)	X ($\alpha=0.739$)	X ($\alpha=0.784$)	A
Preference for Technological Interfaces	X ($\alpha=0.618$)	X -	X ($\alpha=0.623$)	X ($\alpha=0.757$)	A
Desire for Control	X ($\alpha=0.504$)	X ($\alpha=0.6$)	X ($\alpha=0.454$)	X -	A
Perceived Communication Efforts	X ($\alpha=0.666$)	X ($\alpha=0.752$)	X ($\alpha=0.629$)	X -	C
Tangibles	X -	X ($\alpha=0.589$)	X ($\alpha=0.564$)	X -	C
Perceived Risk	X -	X -	X ($\alpha=0.731$)		C
Perceived Service Quality of Technology-based Channels		X ($\alpha=0.635$)	X ($\alpha=0.546$)		C
Perceived Service Quality of Human-based Channel		X -	X ($\alpha=0.686$)		C
Enjoyment with Technology (playful interaction)		X -			A
Enjoyment with Participation		X -		X -	A

Notes:^a A = Affective factor

C = Cognitive factor

^b Perceived service quality five dimensions are the dimensions included in SERVPERF scale (Cronin and Taylor, 1992). Perceived service quality four dimensions are all of these dimensions, with the exception of the tangibles dimension.

- Single-item factors for which calculation of Cronbach's alpha is not possible.

Some differences emerged from the factor analysis compared to the variables that were defined in the model:

- For the debit card and the branch channels, 'perceived service quality' comprised items related to the five dimensions of SERVQUAL. For the telephone-based and the Internet-based channels, it comprised items of four dimensions, excluding items related to

the ‘tangibles’ dimension. Every stratum had a factor for the tangibles dimension. This may reveal that for users of these remote channels, the aspect of equipment/facilities quality constitutes a separate evaluation from overall service quality. This conclusion is in line with their remote nature, as the physical aspect of the branch and the equipment used is a secondary aspect for these channels’ users.

The splitting of the ‘tangibles’ dimension is interesting in light of the results of Parasuraman, Berry, and Zeithaml (1991) in their assessment of the SERVQUAL scale. In their re-evaluation of the scale, the tangibles dimension that originally (Parasuraman et al., 1988) was unidimensional, appeared subdivided into two dimensions, one pertaining to the physical facilities/equipment, and the other to employees/communication materials.

- Perceived ease of use did not emerge as a distinct factor. Although not expected, it is in accordance with the in-depth interviews carried out, where this attribute was not mentioned as relevant for the usage decision of a technology-based delivery channel.
- Unexpected factors, such as ‘Perceived service quality of technology-based / human-based channels’, suggest that channels have intrinsic aspects of service quality that are not revealed in a common service quality dimension covering service quality aspects that are generic to the company whatever the distribution channel considered.

Due to the exploratory nature of the research, to length restrictions of the questionnaire and to the original nature of some of the constructs of the model, it was decided not to use scales already defined in the literature, except for the case of the perceived service quality construct. The measures used were newly developed by the author, based both on existing measures and on insights brought by the in-depth interviews conducted.

Reliability and validity

In empirical research, there is the need to determine the extent to which a particular measurement represents a certain construct. Latent variables are not observed, and so the validity and reliability of their measurement have to be established. The measures (i.e., the constructs) used were assessed in terms of reliability and validity. Almost all variables satisfied the recommended reliability values for exploratory research. Some of the variables with lower reliability values were retained due to their theoretical interest (Nunnally, 1967; Murphy and Davidshofer, 1988). Discriminant validity was assessed by comparing if the correlation coefficient between a scale and any other scale was lower than its Cronbach’s alpha coefficient (Gaski and Nevin, 1985; Andaleeb, 1995). From the overall results, it was

concluded that all variables were acceptable for face, content and discriminant validity criteria.

Ordered Logistic Regressions

Model fitting efforts consisted of multivariate analyses of the data in order to explore and test the hypotheses. By stratum, correlation and univariate analyses were also performed to best understand the data, and to suggest a number of candidate variables to enter the multivariate model.

For the logistic regressions, each variable's estimated odds ratio, standard error, beta coefficient, odds ratio confidence interval, and corresponding p -value are described, together with the measures used to evaluate the model's fit. In logistic regression, the variables' beta coefficients represent the impact of a marginal change of the independent variable over the logit (i.e. the log odds) of the dependent variable. As sometimes, the effect over the logit is not very useful or clear, it is preferable to interpret the impact of the independent variables in terms of the odds. As such, both the odds ratio and the beta coefficient are presented. The estimated odds ratio is the exponentiated estimated beta coefficient and represents the effect of a marginal change of the independent variable over the odds of the dependent variable. For example, an estimated beta coefficient of 'desire for control' of .29 or the estimated odds ratio of 1.33 means that a marginal increase in desire for control will increase the likelihood of more frequent usage of the channel *vs.* less frequent usage (or that the odds of a more frequent usage of the channel are 33% higher for those who feel higher desire for control).

Care was also taken in relation to different types of data (numerical) problems that interfere with model fitting by biasing the estimates and, consequently, leading to erroneous conclusions. Namely, issues such as multi-collinearity, outliers and influential observations, and complete discrimination were evaluated. When such problems were detected, the number of observations was corrected, as suggested by Hosmer and Lemeshow (1989) and Hair, Anderson, Tatham, and Black (1998). Additionally, for each model fitting, the 'Proportional Odds' assumption was tested (the chi-square values for this test are presented by channel). This is a critical assumption of the ordered logit model and states that the beta coefficients do not vary according to the outcome category being considered (Borooah, 2001). Violation of this assumption leads not to one model describing the outcome variable, but to $k-1$ models (k being the number of categories of the outcome variable), each one representing a contrast between one category of the outcome variable and the reference category. In such case, the

model would have to be estimated as a multinomial logit model, notwithstanding the fact that the dependent variable is clearly ordinal.

Complete reliance in the conclusions of the Wald test can be risky (Hauck and Donner, 1977; Jennings, 1986; Menard, 1995). For example, the Wald statistic can produce erroneous conclusions, such as when very large logit coefficients lead to inflated standard errors and to small Wald values (i.e., leading to Type II errors in which the effect of the variable is deemed to be not significant when it is). Therefore, some authors suggest either to complement the Wald test with the likelihood ratio test or even to use only the latter (Hosmer and Lemeshow, 1989; Agresti, 1990; Agresti, 1996). This led to that, although some predictor Wald coefficients were not individually significant, their joint test of significance with other predictors of the model (either cognitive or affective depending on the individual variable in question) and the likelihood ratio test were used to decide whether to keep or discard that individual variable from the model.

According to Hosmer and Lemeshow (1989), “models should not be based entirely on tests of statistical significance. (...) Successful modeling of a complex data set is part science, part statistical methods, and part experience and common sense. (...) The objective is to have the most parsimonious model that best describes the data”. Thus, after fitting the model and estimating the coefficients, the contribution of each variable for the prediction of the dependent variable should be assessed. This stage of variable testing was followed and so, the models presented are the final models for each delivery channel.

Debit card channel

Table 2: Ordinal logistic regression of debit card’s usage

VARIABLES^c	OR	SE(OR)	β	95% CI (OR)	p-value
Desire for control	1.463	.249	.381	(1.048,2.04)	.026
Preference for tech. interfaces	1.258	.121	.23	(1.041,1.52)	.017
Perceived service quality	.835	.11	-.18	(.646,1.08)	.17
Proportional Odds assumption			$\chi^2 = 5.91$	$p\text{-value} = .43$	

Measures of fit

LRT (<i>df</i>) ^a	14.2 (3)	<i>p</i> -value	.003	Log-likelihood	-745.45
AIC	2.056	AIC*n	1502.902	Number obs.	731
BIC ^b	-3290.048	BIC'	5.581		

^a The likelihood ratio test is performed against the log-likelihood of the intercept-only model. In brackets are degrees of freedom.

^b The BIC criterion is more adequate for comparing models than just *per se*. The value of the statistic is reported here for information purposes. It was used for comparison between models.

^c The table presents, by column, the estimated odds ratio, its standard error, the estimated beta coefficient, the 95% confidence interval of the estimated odds ratio and the corresponding *p*-value.

As hypothesized, usage of remote technology-based channels, such as the debit card channel, is influenced by cognitive and affective factors. The significant affective factors are preference for technological interfaces and desire for control (supporting H2 and H3). Higher usage of the debit card channel reflects higher preference for technological interfaces and higher desire for control: a customer using a remote self-service system is controlling the events more than when he expects others to perform the service for him. It is reasonable that those customers with less affection toward technology-based interfaces will prefer to use a human-based delivery system. The relevant cognitive factor for explaining usage frequency of the debit card network is perceived service quality (supporting H7). From the initial set of hypotheses, enjoyment with technology, perceived communication efforts and perceived risk, although present for this channel, did not emerged as significant constructs for explaining usage frequency, therefore H1, H6 and H8 were not confirmed.

Telephone-based channel

Table 3: Ordinal logistic regression of the telephone-based channel's usage

VARIABLES	OR	SE(OR)	β	95% CI (OR)	<i>p</i> -value
Enjoyment with participation	1.196	.111	.179	(.996,1.44)	.055
Perceived service quality	1.098	.156	.094	(.83,1.45)	.511
Perceived service quality of technology-based channels	1.466	.19	.383	(1.14,1.89)	.003
Perceived service quality of human-based channel	1.152	.082	.142	(1,1.32)	.045

Proportional Odds assumption

$\chi^2 = 7.95 \quad p\text{-value} = .44$

Measures of fit

LRT (<i>df</i>) ^a	26.77 (4)	<i>p</i> -value	.000	Log-likelihood	-789.8
AIC	2.364	AIC*n	1593.6	Number obs.	674
BIC ^b	-2764.73	BIC'	-0.721		

^a The likelihood ratio test is performed against the log-likelihood of the intercept-only model. In brackets are degrees of freedom.

^b The BIC criterion is more adequate for comparing models than just *per se*. The value of the statistic is reported here for information purposes. It was used for comparison between models.

Enjoyment with participation, as a relevant predictor of the telephone-based channel usage, reflects the pleasure that participating has on a self-service option usage. As a result, H4 is supported. More specifically, the odds of ‘most days’ *vs.* less frequent usage are 20% higher for those who experience a marginal change in their ‘enjoyment with participation’, that is, for those who prefer to participate and enjoy being involved in the course of action.

Concerning cognitive influences on usage behavior, H7 was supported by the data. As such, the odds of more frequent usage of this channel increase for a marginal increase of perceived service quality as a whole, as well as increasing for marginal increases of perceived service quality of technology-based channels and of the human-based channel. For the telephone-based channel, perceived service quality of the human-based channel consisted of items related to employees’ evaluation. This result can be explained when interpreting the telephone-based channel as also comprising telephone calls requesting the service directly to the account branch: this fact was acknowledged by comments made by telephone-based channel users in their questionnaires. Perceived service quality of technology-based channels also positively influenced the odds of a more frequent usage of the telephone-based channel: this finding is in line with the fact that this channel may involve both person-to-person (mediated by a technological device) and person-to-technology contacts. From the initial set of hypotheses, enjoyment with technology, preference for technological interfaces, desire for control, perceived communication efforts and perceived risk also emerged as factors although not as relevant constructs for explaining usage frequency. As such, H1, H2, H3, H6 and H8 were not supported.

Internet-based channel

Table 4: Ordinal logistic regression of the Internet-based channel usage

VARIABLES	OR	SE(OR)	β	95% CI (OR)	<i>p</i> -value
Desire for control	.934	.097	-.068	(.76,1.15)	.512
Enjoyment with technology	1.779	.233	.576	(1.38, 2.3)	.000
Preference for technological interfaces	1.145	.103	.135	(.96,1.37)	.13
Perceived service quality	.749	.081	-.289	(.6,.93)	.008
Perceived service quality of technology-based channels	1.136	.099	.128	(.96,1.35)	.142
Perceived service quality of human-based channel	1.282	.074	.248	(1.14,1.44)	.000
Perceived risk	.945	.087	-.057	(.79,1.13)	.541
			$\chi^2=$		
Proportional Odds assumption			18.14	<i>p</i> -value = .201	
Measures of fit					
LRT (<i>df</i>) ^a	49.41 (7)	<i>p</i> -value	.000	Log-likelihood	-1693.1
AIC	2.322	AIC*n	3406.13	Number obs.	1467
BIC ^b	-7236.82	BIC'	1.626		

^a The likelihood ratio test is performed against the log-likelihood of the intercept-only model. In brackets are degrees of freedom.

^b The BIC criterion is more adequate for comparing models than just *per se*. The value of the statistic is reported here for information purposes. It was used for comparison between models.

Again, channel frequency usage is determined by cognitive and affective reasons. The affective factors include enjoyment with technology, preference for dealing with technological interfaces, and desire for control (supporting H1, H2 and H3). Enjoyment with technology is only relevant for the explanation of the Internet-based channel usage frequency. This variable represents the pleasure dimension of technology usage, describing the joy and excitement one feels emotionally when interacting with technology, which is in line with the higher technology content (compared to other channels) of this channel.

The cognitive factors include perceived service quality, perceived service quality of technology-based interfaces, perceived service quality of human-based interfaces, and perceived risk (supporting H6 and H7). For this channel ‘perceived communication efforts’ did not emerge as a significant predictor of usage frequency, therefore H8 was not supported.

Branch channel

Table 5: Ordinal logistic regression of the branch channel usage

VARIABLES	[^] OR	[^] SE(OR)	[^] β	[^] 95% CI (OR)	<i>p</i> -value
Perceived service quality	2.33	.544	.846	(1.47,3.68)	.000
Tangibles	.68	.103	-.386	(.51,.92)	.011
Perceived communication efforts	.932	.135	-.07	(.702,1.24)	.628
				<i>p</i> -value =	
Proportional Odds assumption			χ ² = 8.35	.214	
Measures of fit					
LRT (<i>df</i>) ^a	17.22 (3)	<i>p</i> -value	.000	Log-likelihood	24.34
AIC	2.178	AIC*n	790.761	Number obs.	363
BIC ^b	-1325.54	BIC'	0.46		

^a The likelihood ratio test is performed against the log-likelihood of the intercept-only model. In brackets are degrees of freedom.

^b The BIC criterion is more adequate for comparing models than just *per se*. The value of the statistic is reported here for information purposes. It was used for comparison between models.

Implicit to the model presented, is the hypothesis that channel usage is influenced by two groups of variables: a cognitive group of predictors and an affective group of predictors. The final model for branch channel usage only included cognitive predictors: perceived service quality, tangibles, and perceived communication efforts, supporting H7 and H8. No affective variable was present in the final solution (H1, H2, H3 and H4 were not supported). Perceived service quality of the ‘tangibles’ dimension only emerged as a significant influence for the branch channel’s usage. The branch is the delivery channel where the physical,

tangible element of the offer is more visible and more relevant for the definition of the service.

DISCUSSION

In this study, the objective was to expand previous research by examining explanatory processes, by model building, and by testing the role of affective/cognitive constructs in customers' behavior, in a context of technology infusion in bank delivery channels. The results of this effort will be discussed in relation to the channels and the cognitive/affective set of variables.

Cognitive Determinants

Cognitive determinants were found to be valid predictors of consumer behavior toward stronger adoption (in terms of usage frequency) of technology-based delivery channels, confirming general consumer behavior theories and innovation adoption models (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Gatignon and Robertson, 1985; Davis et al., 1989; Ajzen, 1991; Rogers, 1995).

It is concluded that perceived risk makes a significant negative contribution to explain Internet-based usage of bank services. This would be expected when Internet shopping is seen as the riskiest delivery channel (Donthu and Garcia, 1999; Tan, 1999; Forsythe and Shi, 2003). One might say that the perception of risk is higher due to the innovative, non-controlled environment that this channel represents.

The model fitting results show that for all channels, perceived service quality is a significant predictor of channel usage frequency. In particular, perceived service quality negatively influences the debit card and the Internet-based channel usage and positively influences telephone-based and branch usage. The expected result would be for an increase in the perceptions of service quality leading to an increase in channel usage. This has been shown by other researchers, investigating the consequences of service quality perceptions over different types of behavioral intentions (LaBarbera and Mazursky, 1983; Reicheld and Sasser, 1990; Boulding et al., 1993). However, in the model explaining debit card and Internet-based channel usage frequency, perceived service quality, although significant, was negatively related to usage. For the debit card channel, one possible explanation can be found when looking at the items comprised in this factor: they refer to the employee/customer interaction. It might be that the more a debit card user perceives quality in this personal interaction, the less it will use the debit card network. As for the Internet-based channel, one

possible explanation for this relationship can be found by looking at the results for the constructs of perceived service quality of both the technology-based and the human-based channels. These perceptions, specific to the delivery channels, are stronger predictors of usage of the bank Internet service, showing that the more relevant perceptions determining usage are the ones related to the characteristics of the delivery channels and not those related to global evaluation of the bank as a whole. For the Internet-based channel, it could be that the more one is known and receives personalized attention in the branch, the more one will increase usage of an impersonal channel, as corresponding to a desire for anonymity and a lower need to contact and obtain the service through human tellers. Recall that, for the respondents with Internet-based access, the variable 'preference for dealing with technological interfaces' was significant and positively related to channel usage.

Perceived service quality of the technology-based channel represents a significant influence over channel usage for both the telephone-based and the Internet-based channels. An interesting aspect is that this influence is stronger than the influence of the general construct of perceived service quality for these channels. This may suggest that bank managers should favor elements that increase perceptions of service quality specific for these technology-based channels, such as service consistency across remote channels, clear instructions on how to use the channels and personalized service.

Perceived communication efforts was found to be a significant contributor to explain the branch usage frequency. An interesting finding is that this is the channel characterized by face-to-face interactions, highlighting the potential of this channel for advising on bank usage and as a communication vehicle about new products/ channels/ procedures.

The branch sample, effectively demonstrated the contrast with technology-based channels, for which both cognitive and affective variables acted as significant predictors of channel usage frequency. A possible explanation can be that, for almost all the banks' business life, branches were the sole delivery channel. So, for users of this channel there might be no innovation related to the human-interface. This lack of glamour, of novelty, of surprise in the delivery channel can explain usage decisions being motivated only by cognitive reasons and not by the affective factors considered in the analysis. Moreover, this result represents an avenue for improvement in the branch network, especially for the high value-added banking operations or for cross-selling opportunities.

Overall, cognitive determinants play a significant role in explaining usage frequency of the delivery channels studied.

Affective Determinants

The results show that affective influences were only relevant predictors of usage frequency for the remote channels. Has the branch lost its ability to provoke emotional reactions from customers, leaving its thrust to a functional perspective? For remote technology-based channels, both cognitive and affective influences have a say in the way a channel's users decide their degree of usage frequency. Therefore, the results confirm that consumers can appreciate a delivery interface for the fun, enjoyment and positive feelings that the interaction evokes, independently of rationalizing the utility they may derive from using such an interface. This confirms the experiential perspective of consumer behavior (Klinger, 1971; McGregor, 1974; Olshavsky and Granbois, 1979; Holbrook and Hirschman, 1982; Holbrook et al., 1984) applied to usage frequency of technology-based delivery channels.

Concerning enjoyment with technology, the variable was only considered relevant to explain Internet-based channel usage. A possible explanation might be that the debit card and the telephone-based channels are considered established and not particularly likely to induce any excitement with their use. These channels have been available to banking customers for several decades, and their usage might not be offering joy and excitement similar to the usage of an Internet-based channel, which is more recent for bank customers. As expected, preference for dealing with technological interfaces is a significant regressor for the debit card and Internet-based channel usage frequency. It is understandable that bank users with a higher preference for interacting with technological devices or self-service options, will favor in their interactions with the bank (increasing their usage frequency) those delivery channels mediated by technology.

Desire for control emerges as a significant predictor in two channels: in the debit card channel, the variable represents a positive contribution for the explanation of the channel's usage frequency, whereas for the Internet-based channel it represents a negative contribution. In the debit card channel, the environment can be considered familiar and known to customers, who would then perceive control over that environment and would wish to control it. Alternatively, in the Internet-based channel, customers face a novel environment: customers' lack of dominance may reduce their desire for controlling the environment. The results are in accordance with Janis and Mann's (1977) conclusion that people become decision averse in risky choices. Internet banking is still unfamiliar for the majority of bank customers, who would then perceive higher risks in this channel as compared to others. Therefore, it is possible that, to avoid making bad decisions and facing the consequences, on-line bank customers have less motivation for control: at least, while the environment is not as

familiar as the debit card system. The results mirror the conclusions of Langeard, Bateson, Lovelock, and Eiglier (1981) and Bateson (1985a), and may illustrate that increased desire for control produces a higher or lower customer motivation to use more frequently a technology-based delivery option, depending on the degree of familiarity that customers have with the technology-based options.

Enjoyment with participation contributes positively in explaining telephone-based channel usage. The level of customer participation, in the presence of alternative delivery options, derives from the propensity to participate that customers have which, in turn, will derive from the attractiveness that participating and being involved has to customers (Langeard et al., 1981; Dabholkar, 1996).

Overall for the technology-based delivery channels, cognitive and affective variables determined usage. For the branch, usage frequency was only determined by cognitive influences.

RESEARCH IMPLICATIONS

This research has attempted to clarify how technology infusion in bank delivery channels affects customers' perceptions and decisions. It is an exploratory study aimed at revealing the determinants behind bank channel users' decisions, namely the usage frequency decision by delivery channel. The research literature has repeatedly asked for contributions in customer interaction with technology-based service deliveries (Mick and Fournier, 1998; Steenkamp et al., 1999; Bitner et al., 2000; Meuter et al., 2000).

The results from this research suggest and confirm that both affective and cognitive factors determine technology acceptance and usage, contrasting with traditional models that explain technology acceptance, innovation diffusion and adoption (Gatignon and Robertson, 1985; Davis et al., 1989; Rogers, 1995) only favoring cognitive influences. For the customer, technology delivery applications can represent positive outcomes, such as convenience, cost, or time savings. They can also represent disadvantages, such as risk or complexity. All these factors are cognitively processed by the customer when deciding whether to increase or not its usage of a bank delivery channel. However, research results illustrate that in all remote delivery channels (contacts mediated by technology), the frequency of usage was determined by affective and cognitive variables. The composition of these influences, however, varied among channels. The results are to be analyzed by channel, with meaningful comparison only for the broad nature of the variables (cognitive versus affective). This conclusion confirms

that customer/technology interaction in terms of usage frequency contains both rational and emotional elements. As such, the result aligns with the conclusions of the Portuguese neuroscientist Damásio (1995,1999) about the role of emotions and feelings in human behavior.

Usually, decisions on high involvement situations are theorized to depend on cognitive factors. In this paper, we consider the usage frequency decision concerning a bank delivery channel as a high involvement decision, due to the risks and security concerns that remote channels provoke and the assets involved – monetary funds of the customer. Results illustrate that this decision also depends on affective reasons, which are usually only researched for impulse buying or in low involvement buying/choice decisions

The analysis also shows that the specific affective and cognitive determinants of each delivery channel usage depend on the channel. Concerning financial services, the core service is basically the same between channels. The differences come from the interface considered to provide the service. Additionally, the results show that technology-based channels differ from the branch channel, in terms of cognitive vs. affective usage frequency determinants.

In terms of research limitations, this research is of an exploratory nature and of limited scope. One of the most common problems lies in the extent to which the empirical results obtained can be generalized to other samples and contexts. The analysis concentrated in one firm from one service industry (a bank). One question arises about the generalization of the conclusions to other banks or other service industries. An interesting avenue for future research would be to replicate the model with other banks and with other service industries characterized by multiple delivery channels (technology-based and human-based). This extension or replication could enlighten the generalization of the findings.

Further, the cognitive and affective variables presented in the model are, by model design, not influencing each other. It is acknowledged that important interactions between cognitive and/or affective variables might exist: however, the intent was to explore channel usage incorporating the variables that represent the most critical influences. These efforts comprised an initial qualitative stage, with in-depth interviews with both bank managers and customers, and extensive literature research. The model presented could be explored further, by integrating other variables as predictors of usage. For example, ‘familiarity with technology’ or ‘familiarity with the channel’ could be explored as an additional influence on usage. The model could also be extended to include relationships and interactions between the variables. Additionally, there still might be confusion between the need for a banking

operation and the channel used to perform it: one way to overcome this weakness could be to perform the research considering only one banking operation common to all channels.

One major avenue for future research concerns the analysis of channel choice determinants, considering all the data collected. In this paper, we analyze a subset of the usage decision (i.e., usage frequency), but it would be very interesting the study of the nature and composition of the influences for bank delivery channel's choice. Another aspect that could be researched in future work would be to use the same regression model (with the same predictors) between channels and analyze potential differences.

Another interesting opportunity for further research would be to study usage of the delivery channel considering both the frequency of usage and the number of different operations carried out within each delivery channel (or the relative proportion, as delivery channels may differ in the banking operations allowed). This could be done separately, or a usage index could be created describing the two aspects: usage frequency and breadth of usage, using Zaichkowsky's (1985) terms. Zaichkowsky (1985) defined breadth of usage as the variety of use situations. A measure comprising the two facets of usage could extend the knowledge of technology impact in usage behavior.

Managerial Implications

The research results have the potential to offer new and important insights concerning customers' usage frequency of bank delivery channels. The findings clarify the determinants of this decision for each delivery channel, offering more and better information for banks, so to allow them to better characterize their customer base. The enhanced customer profiles will affect behavioral and evaluation outcomes. Some examples of how the research conclusions will impact managers' decisions can be suggested:

Significant affective factors for the debit-card users, such as 'preference for dealing with technological interfaces' and 'desire for control', illustrate that, for increasing usage, bank communications for these users should emphasize the fact that usage of this interface allows independent interaction, in which the user controls the interaction process without having to deal with a bank contact employee.

Managers of the Internet-based channel have witnessed an increase in Internet usage across service industries, although with lower growth rates than expected. To enhance these usage rates, managers will have to capture what produces the desired behavior from customers. From the research results, it can be seen that for Internet channel users, bank managers can increase the likelihood of more frequent usage of the channel by clarifying the

procedures and reducing the complexity of using the channel through clear instructions and examples of how to perform banking transactions. Providing a global high quality service across channels will also impact usage frequency. Perceived risk is an important issue for Internet shopping, especially in the banking industry with all the current concerns about phishing, lack of security and confidentiality. Developing strong efforts to assure customers of the absence of risk in channel usage is a necessary condition for users to increase their usage of the Internet-based channel. Managers should address these users with specific communications targeted to allay customers' fears.

Branch managers will also benefit from knowing what their users react to, in order to achieve the objective of transferring low value added operations to remote channels. The positive outcomes (financial and time benefits) of the remote channels must be stressed together with customer education on how to use the remote channels and assurance that the bank will cover the risks involved. From the interviews carried out, it was found that too often the lower prices of banking operations through remote channels or the instructions on how to use them are not common knowledge among branch users, who consider remote channels and technological interfaces as a distant reality.

Moreover, the research results show that for firms with a multiple channel strategy, users of different channels have different attitudinal and perception profiles. Therefore, the communications strategy has to address these differences, instead of being a single strategy, designed for all target customers. Users behave and evaluate differently technology-based and human-based distribution channels. These differences have to be incorporated in companies' marketing strategies. Bank strategies can benefit from knowing which variables affect usage decisions of a specific delivery channel, and in which direction.

In terms of human resource management, one important implication concerns the training that contact employees need in terms of providing the desired experience to customers. In the branch and telephone-based channels, contact employees have a major role in transferring routine transactions to the debit-card and the Internet-based channels. Consequently, it is essential they know which aspects to stress according to the channel. This research can provide the answer to optimizing employees' effort in such a challenge.

Overall, it can be said that the aspects found, by channel, to influence the frequency with which customers of those channels use them should be emphasized by managers in order to better achieve their objectives. This way, the research conclusions set a direction for improving the effectiveness and the efficiency of company actions to reach their customers.

The study was designed to explore the influence of cognitive and affective-based attitudes on customers' usage frequency decisions. To that purpose, and despite its limitations, the findings of this study provide a platform for future investigation and diagnosis, as well as yielding valuable insights into the importance of a number of pertinent variables.

REFERENCES

- Agresti, A. (1990). *Categorical data analysis*. New York, NY: John Wiley and Sons.
- Agresti, A. (1996). *An introduction to categorical data analysis*. New York, NY: John Wiley and Sons.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- Ajzen, I., and Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Andaleeb, S. (1995). Dependence relations and the moderating role of trust: Implications for behavioral intentions in marketing channels. *International Journal of Research in Marketing*, 12(2), 157-172.
- Apte, U. M., and Vepsalainen, A. P. (1993). High tech or high touch? Efficient channel designs for delivering financial services. *Journal of Strategic Information Systems*, 2(1), 39-54.
- Bateson, J. E. (1985a). Self-service consumer: An exploratory study. *Journal of Retailing*, 61(3), 49-76.
- Bateson, J. E. (1985b). Perceived control and the service encounter. In J. Czepiel, M. Solomon, and C. Surprenant (Eds.), *The Service Encounter*. Lexington, MA: Lexington Books, 67-82.
- Bateson, J. E., and Hui, M. K. (1990). The effects of perceived control and customer crowding on the service experience. *Marketing Science Institute Working Paper Series, Report No.90-105*. Cambridge, MA: Marketing Science Institute.

Berry, L. L. (1985). Big ideas in services marketing. In M. Venkatesan, D. Schmalensee, and C. Marshall (Eds.), *Creativity in Services Marketing: What's New, What Works, What's Developing*. Chicago, IL: American Marketing Association, 6-8.

Berry, L. L., and Parasuraman, A. (1991). *Marketing Services*. New York, NY: Macmillan.

Bettman, J. R. (1982). A functional analysis of the role of overall evaluation of alternatives in choice processes. In A. Mitchell (Ed.), *Advances in Consumer Research*, 9. Ann Arbor, MI: Association for Consumer Research, 87-93.

Bhatnagar, A., Misra, S., and Rao, H. R. (2000). On risk, convenience, and Internet shopping behavior. *Communications of the ACM*, 43(11), 98-105.

Bitner, M. J., Brown, S. W., and Meuter, M. L. (2000). Technology infusion in service encounters. *Journal of the Academy of Marketing Science*, 28(1), 138-149.

Bitner, M. J., Faranda, W. T., Hubbert, A. R., and Zeithaml, V. A. (1997). Customer contributions and roles in service delivery. *International Journal of Service Industry Management*, 8(3), 193-205.

Black, N. J., Lockett, A., Ennew, C., Winklhofer, H., and McKechnie, S. (2002). Modelling consumer choice of distribution channels: An illustration from financial services. *International Journal of Bank Marketing*, 20(4), 161-173.

Bloch, P. H., and Bruce, G. D. (1984). Product involvement as leisure behavior. In T. Kinnear (Ed.), *Advances in Consumer Research*, 11. Ann Arbor, MI: Association for Consumer Research, 197-202.

Borooah, V. (2001). *Logit and probit: Ordered and multinomial models*. Thousand Oaks, CA: Sage University Paper Series on Quantitative Applications in the Social Sciences.

Boulding, W., Kalra, A., Staelin, R., and Zeithaml, V. A. (1993). A dynamic process model of service quality: From expectations to behavioral intentions. *Journal of Marketing Research*, 30(1), 7-27.

Burger, J. M., and Cooper, H. M. (1979). The desirability of control. *Motivation and Emotion*, 3, 381-393.

Cronin, J. J., and Taylor, S. A. (1992). Measuring service quality: A re-examination and extension. *Journal of Marketing*, 56(3), 55-68.

Cunningham, S. M. (1967). The major dimensions of perceived risk. In D. F. Cox (Ed.), *Risk Taking and Information Handling in Consumer Behavior*. Boston, MA: Harvard University Press, 82-108.

Dabholkar, P. A. (1990). How to improve perceived service quality by increasing customer participation. *Proceedings of the Thirteenth Annual Conference of the Academy of Marketing Science*, Cullowhee, NC: Academy of Marketing Science, 483-487.

Dabholkar, P. A. (1994). Technology-based service delivery: A classification scheme for developing marketing strategies. In T. Swartz, D. Bowen, and S. Brown, (Eds.), *Advances in Services Marketing and Management*, 3. Greenwich, CT: JAI Press, 241-271.

Dabholkar, P. A. (1996). Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *International Journal of Research in Marketing*, 13(1), 29-51.

Damásio, A. R. (1995). *Descartes' error: Emotion, reason and the human brain*. New York, NY: Harper Collins.

Damásio, A. R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York, NY: Harcourt Brace.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1003.

Devlin, J. F. (1995). Technology and innovation in retail banking distribution. *International Journal of Bank Marketing*, 13(4), 19-26.

Donthu, N., and Garcia, A. (1999). The Internet shopper. *Journal of Advertising Research*, 39(3), 52-58.

Dowling, G. R., and Staelin, R. (1994). A model of perceived risk and intended risk-handling activity. *Journal of Consumer Research*, 21(1), 119-134.

Eroglu, S. A., Machleit, K. A., and Davis, L. M. (2000). Online retail atmospherics: Empirical tests of a cue typology. *Proceedings of the 6th Triennial National Retailing Conference*, Columbus, OH: Academy of Marketing Science, 144-150.

Fishbein, M., and Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Forsythe, S. M., and Shi, B. (2003). Consumer patronage and risk perceptions in Internet shopping. *Journal of Business Research*, 56(11), 867-875.

Gaski, J., and Nevin, J. (1985). The differential effects of exercised and unexercised power sources in a marketing channel. *Journal of Marketing Research*, 22(May), 130-142.

Gatignon, H., and Robertson, T. S. (1985). A propositional inventory for new diffusion research. *Journal of Consumer Research*, 11(4), 849-867.

Goodwin, C., and Radford, R. (1993). Models of service delivery: An integrative perspective. In S. Brown, D. Bowen, and T. Swartz (Eds.), *Advances in Services Marketing and Management*, 2. Greenwich, CT: JAI Press, 231-252.

Gronroos, C. (1988). Service quality: The six criteria of good perceived quality. *Review of Business*, 9(3), 10-13.

Groves, R. M., Cialdini, R. B., and Couper, M. P. (1992). Understanding the decision to participate in a survey. *Public Opinion Quarterly*, 56(4), 475-495.

Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. (1998). *Multivariate Data Analysis (5th Ed.)*. Upper Saddle River, NJ: Prentice-Hall.

Harden, G. (2002). E-banking comes to town: Exploring how traditional UK high street banks are meeting the challenge of technology and virtual relationships. *Journal of Financial Services Marketing*, 6(4), 323-332.

Hauck, W., and Donner, A. (1977). Wald's test as applied to hypotheses in logit analysis. *Journal of the American Statistical Association*, 72(360), 851-853.

Heim, G. R., and Sinha, K. K. (2000). Design and delivery of electronic services: Implications for customer value in electronic food retailing. In J. Fitzsimmons and M. Fitzsimmons (Eds.), *New service development: Creating memorable experiences*. Thousand Oaks, CA: Sage Publications, 152-182.

Henderson, K. V., and Kunz, M. B. (2001). Is it worth clicking or driving to the retailer?. In T. Suter (Ed.), *Marketing Advances in Pedagogy, Process, and Philosophy*. Stillwater, OK: Society for Marketing Advances, 221-224.

Heute, L., and Roth, A. V. (1988). The industrialization and span of retail banks' delivery systems. *International Journal of Operations Management*, 8(3), 46-66.

Hirschman, E. C. (1983). Aesthetics, ideologies and the limits of the marketing concept. *Journal of Marketing*, 47(3), 45-55.

Hisrich, R. D., Dornoff, R. J., and Kernan, J. B. (1972). Perceived risk in store selection. *Journal of Marketing Research*, 9(4), 435-439.

Holbrook, M. B., and Hirschman, E. C. (1982). The experiential aspects of consumption: consumer fantasies, feelings, and fun. *Journal of Consumer Research*, 9(2), 132-140.

Holbrook, M. B., Chestnut, R. W., Oliva, T. A., and Greenleaf, E. A. (1984). Play as a consumption experience: The roles of emotions, performance, and personality in the enjoyment of games. *Journal of Consumer Research*, 11(2), 728-739.

Hosmer, D. W., and Lemeshow, S. (1989). *Applied logistic regression*. New York, NY: John Wiley and Sons.

Janis, I. L., and Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice, and commitment*. New York, NY: Free Press.

Jennings, D. (1986). Judging inference adequacy in logistic regression. *Journal of the American Statistical Association*, 81, 471-476.

Kimball, R. C., Frisch, R., and Gregor, W. T. (1997). Alternative visions of consumer financial services. *Journal of Retail Banking Services*, 21(1), 1-10.

Klinger, E. (1971). *Structure and functions of fantasy*. New York, NY: Wiley-Interscience.

LaBarbera, P., and Mazursky, D. (1983). A longitudinal assessment of consumer satisfaction/dissatisfaction: The dynamic aspect of the cognitive process. *Journal of Marketing Research*, 20(4), 393-404.

Langeard, E., Bateson, J. E., Lovelock, C. H., and Eiglier, P. (1981). Services marketing: New insights from consumers and managers. *Marketing Science Institute Report, No. 81-104*. Cambridge, MA: Marketing Science Institute.

Lee, J., and Allaway, A. (2002). Effects of personal control on adoption of self-service technology innovations. *Journal of Services Marketing*, 16(6), 553-572.

McGregor, R. C. (1974). Art and the aesthetic. *Journal of Aesthetics and Art Criticism*, 32(4), 549-559.

Mehrabian, A., and Russel, J. A. (1974). *An approach to environmental psychology*. Cambridge, MA: M.I.T. Press.

Meuter, M. L., Ostrom, A. L., Bitner, M. J., and Roundtree, R. (2003). The influence of technology anxiety on consumer use and experiences with self-service technologies. *Journal of Business Research*, 56(11), 899-906.

Menard, S. (1995). *Applied logistic regression analysis*. Thousand Oaks, CA: Sage University Paper Series on Quantitative Applications in the Social Sciences.

Meuter, M. L., Ostrom, A. L., Roundtree, R. I., and Bitner, M. J. (2000). Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, 64(3), 50-64.

Mick, D. G., and Fournier, S. (1998). Paradoxes of technology: Consumer cognizance, emotions, and coping strategies. *Journal of Consumer Research*, 25(2), 123-147.

Mitchell, V-W. (1994). Perceived risk: A critical review of application and use over 30 years. *Marketing Working Papers Series, No.9401*. Manchester, UK: Manchester School of Management, UMIST.

Mulligan, P., and Gordon, S. R. (2002). The impact of information technology on customer and supplier relationships in the financial services. *International Journal of Service Industry Management*, 13(1), 29-46.

Murphy, K., and Davidshofer, C. (1988). *Psychological testing*. Englewood Cliffs, NJ: Prentice-Hall.

Murray, K. B. (1991). A test of services marketing theory: Consumer information acquisition activities. *Journal of Marketing*, 55(1), 10-25.

Nunnally, J. (1967). *Psychometric Theory*. New York, NY: McGraw-Hill.

Olshavsky, R. W., and Granbois, D. H. (1979). Consumer decision making – Fact or fiction?. *Journal of Consumer Research*, 6(2), 93-100.

Osborne, H. (1979). Some theories on aesthetic judgement. *Journal of Aesthetics and Art Criticism*, 38(2), 135-144.

Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2(4), 307-320.

- Parasuraman, A., Berry, L. L., and Zeithaml, V. A. (1991). Refinement and reassessment of SERVQUAL scale. *Journal of Retailing*, 67(4), 420-450.
- Parasuraman, A., Zeithaml, V. A., and Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40.
- Poczter, A. (1987). Attitude development hierarchy and segmentation. *Review of Business*, 9(1), 17-20.
- Pyun, C. S., Scruggs, L., and Nam, K. (2002). Internet banking in the U.S., Japan and Europe. *Multinational Business Review*, 10(2), 73-81.
- Ram, S., and Jung, H-S. (1991). How product usage influences consumer satisfaction. *Marketing Letters*, 2(4), 403-411.
- Rayport, J. F., and Sviokla, J. J. (1995). Exploiting the virtual value chain. *Harvard Business Review*, November-December, 75-85.
- Reichheld, F., and Sasser, W. Jr (1990). Zero defections: Quality comes to services. *Harvard Business Review*, 68(5), 105-111.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: The Free Press.
- Roth, A. V., and and Velde, M. (1989). Investing in the retail delivery system technology. *Journal of Retail Banking*, 11(2), 23-34.
- Sarel, D., and Marmorstein, H. (2002). Migrating customers to new distribution channels: The role of communication. *Journal of Financial Services Marketing*, 6(3), 254-266.
- Smith, A. M. (1989). Service quality: Relationships between banks and their small business clients. *International Journal of Bank Marketing*, 7(5), 28-36.

- Steenkamp, J-B. E., Hofstede, F., and Wedel, M. (1999). A cross-national investigation into the individual and national cultural antecedents of consumer innovativeness. *Journal of Marketing*, 63(2), 55-69.
- Tan, S. J. (1999). Strategies for reducing consumers' risk aversion in Internet shopping. *Journal of Consumer Marketing*, 16(2), 163-180.
- Tangsrud, R. R., and Smith, M. C. (2001). Me, we or thee? A perceived control perspective on consumer decision autonomy. *Academy of Marketing Studies Journal*, 5(1), 11-27.
- Taylor, J. W. (1974). The role of risk in consumer behavior. *Journal of Marketing*, 38(2), 54-60.
- Te'eni, D. (1989). Determinants and consequences of perceived complexity in human-computer interaction. *Decision Sciences*, 20(1), 166-181.
- Unger, L. S., and Kernan, J. B. (1983). On the meaning of leisure: An investigation of some determinants of the subjective experience. *Journal of Consumer Research*, 9(4), 381-392.
- Walker, R. H., Craig-Lees, M., Hecker, R., and Francis, H. (2002). Technology-enabled service delivery. *International Journal of Service Industry Management*, 13(1), 91-106.
- Zaichkowsky, J. L. (1985). Familiarity: Product use, involvement or expertise?. In E. Hirshman, and M. Holbrook (Eds.), *Advances in Consumer Research*, 12. Provo, UT: Association of Consumer Research, 296-299.
- Zajonc, R. B., and Markus, H. R. (1982). Affective and cognitive factors in preferences. *Journal of Consumer Research*, 9(2), 123-131.
- Zeithaml, V. A., and Gilly, M. C. (1987). Characteristics affecting the acceptance of retailing technologies: A comparison of elderly and nonelderly consumers. *Journal of Retailing*, 63(1), 49-68.